

The following table will aid in separating the species:

- | | |
|--|---------------------|
| 1. Antennæ yellow, base of each segment black | .hebes |
| Antennæ, except basal segments, brown | 2 |
| 2. Lateral appendages of the ninth sternite (below the pleural appendages)
without a lower pendulous or claw-like arm | madera |
| Lateral appendages with a lower pendulous or claw-like arm | 3 |
| 3. Lateral appendages with only two arms | 4 |
| Lateral appendages with three arms | 6 |
| 4. Lower arm of lateral appendage slender; membranous, nearly straight .. | fallax |
| Lower arm of lateral appendage more strongly chitinized, claw-like, tip
blackish | 5 |
| 5. Lower arm of lateral appendages short, broad, flat | rohweri |
| Lower arm of lateral appendages long, slender | grata |
| 6. The two upper arms of lateral appendages consisting of two small subequal,
spine-like processes | coloradensis |
| First and second arms of lateral appendages very different in size and shape ... | 7 |
| 7. The blade-like processes arising from the posterior margin of the ninth
sternite long, slender, sinuous | alia |
| The blade-like processes shorter, more triangular | newcomeri |

PSEUDOSCORPIONS IN ANT NESTS.

By WILLIAM MORTON WHEELER,

Bussey Institution, Harvard University.

The sporadic occurrence of pseudoscorpions, especially of species of *Chelifer* and *Chernes*, in ant nests has been reported by several authors. Haldemann¹ seems to have been the first to note this occurrence in America. Wasmann² states that species of the genus *Chelifer* are not uncommon in ant nests, "but apparently only as occasional inquilines." He also says that he received from Mr. Pergande specimens of *Chelifer* that had been taken in nests of the American *Aphaenogaster fulva*. Banks³ describes several pseudoscorpions taken by Brues in the nests of Texan ants, namely *Chelanops unicolor* with *Eciton cæcum* and *Pachycondyla*

¹On the Occurrence of Cremastocheilus and other Insects in Ant Nests, and of Chelifer found Parasitic under the Elytra of Alaus oculatus. Amer. Journ. Sci. Arts (2) VI, 1848, pp. 148-149; Ann. Mag. Nat. Hist., 1848, pp. 221-222.

²Kritisches Verzeichniss der myrmekophilen und termitophilen Arthropoden. Berlin, Felix L. Dames, 1894, p. 193.

³The Pseudoscorpions of Texas. Bull. Wis. Nat. Hist. Soc., VI, 1908, pp. 39-42.

harpax, *Ideobisium rufulum* with *Camponotus sansabeanus* and *Olpium minutum* with *Eciton caecum*. I have myself not infrequently taken single pseudoscorpions of different species in the nests of various ants, and have received them in vials of ants sent to me for identification, but I have till recently supposed that they were accidental intruders and not myrmecophiles in the proper sense of the word.

Donisthorpe¹ gives the following more precise notes on three species of pseudoscorpions which he found in England: "*Chernes scorpoides*, Herm. In May last this species was found in the greatest profusion in *F. rufa* nests at Buddon Wood, Leicestershire. Mr. Wallace Kew, who kindly identified them for me, told me there were males, females, and females carrying eggs externally, present. They occurred in the nests, literally in thousands, especially at the very bottom of the nest. Every handful of the *débris* of the nests placed on paper was seen to be swarming with the *Chelifers*. The ants paid no attention to them. It has been recorded with the same ant in Denmark by Hansen. I have taken it sparingly with *F. rufa* at Weybridge (Ent. Rec., 1907, p. 255), and have introduced specimens into my observation nests. The ants treated them with indifference. When a *F. rufa* worker was forced to take hold of a *Chelififer*, it dropped it at once. I think it is quite clear that this species, at least, cannot be said to have 'nothing to do with ants.' *Ideoroncus cambridgii*, L. Koch.—Several specimens were found in nests of *L. flavus* at Virtuous Lady Mine, in Devonshire, in April. *Chthonius rayi*, L. Koch, occurred in a nest of *F. rufa* in Parkhurst Forest, Isle of Wight, in April. I have taken this common species before with *L. fuliginosus* at Oxshott."

On January 15, 1811, while collecting at Point Joe, near Pacific Grove, Cal., I came upon many flourishing colonies of *Formica subpolita* nesting under rough stones in the grass near the sea-beach. In every nest there were great numbers of snow-white root-coecids and root-aphids, several small white Isopods of an undescribed species, apparently related to the European *Platyarthrus hoffmanseggi*, and a dozen or more pseudoscorpions. These, which have been kindly identified for me by Mr. H. E. Ewing as

¹On the Founding of Nests by Ants; and a Few Notes on Myrmecophiles. Ent. Rec. and Journ. Var. XXII, 1910.

specimens of *Chelanops dorsalis* Banks, were clinging to the lower surfaces of the stones, and were usually resting quietly in the small depressions or crevices, with their legs and chelæ folded up against their bodies. They were often covered with clusters of ants which seemed to be quite unaware of their presence. In the same locality and under stones of the same size, there were also many colonies of a Myrmicine ant, *Aphanogaster subterranea* var. *occidentalis*, but none of these contained any of the insects, Isopods or pseudoscorpions above mentioned. I believe, therefore, that *Chelanops dorsalis* may properly be regarded as a synœkete, or indifferently tolerated guest, of *F. subpolita*. At any rate, the observations here recorded and those of Donisthorpe above quoted, suggest that the association of pseudoscorpions with ants may not be as accidental and insignificant as we have hitherto supposed.

FLUFFY CECROPIA COCOONS.

By PHIL RAU,
St. Louis, Missouri.

Much discussion has been carried on¹ as to the nature and abundance of the large, loosely woven cocoons of *Samia cecropia* Linn.

Chief among the conclusions to be gleaned from these casual observations are: (1) that the fluffy cocoons occur only on low boughs or in damp places; (2) that they bring forth only female insects, and (3) that they harbor only parasitized pupæ. All of the writers agree that they are uncommon, or even "rare."

The following data collected upon this subject during the past two seasons will probably throw some light upon these little understood points.

In the spring of 1910 and also 1911, large numbers of the cocoons were gathered at random about the fields near River des Peres and Macklind Avenue, St. Louis. In making these collections, no appreciable difference was observed in the positions of the two kinds of cocoons, the large, fluffy ones as well as the tightly woven ones occurring in both the high and the low, the dry and the damp positions.

¹Ent. News, Vols. XI-XIII, XVII.